

**REMARKS**

Claims 1-10 are pending in the above-referenced application. Claims 9 and 10 have been withdrawn from consideration in connection with this application in view of Applicant's election to pursue claims 1-8. Applicant hereby affirms its election to pursue claims 1-8 and requests that withdrawn claims 9 and 10 be rejoined to this application upon the allowance thereof.

Claims 5 and 7 are objected to in the instant office action pursuant to 37 C.F.R. §1.75(c). Claim 7 is additionally rejected (as is claim 6) pursuant to 35 U.S.C. §103(a), and claims 1-4 and 8 are rejected pursuant to 35 U.S.C. §102(b). Claim 5 is not listed in paragraph 7 of the office action as being rejected pursuant to 35 U.S.C. §102(b), and is likewise not listed any of paragraphs 14-17 as being rejected pursuant to 35 U.S.C. §103(a). However, claim 5 is discussed in paragraph 8 of the instant office action; thus, Applicant will assume that this claim is rejected pursuant to 35 U.S.C. §102(b) for purpose of responding to the instant office action. This assumption is being made solely in order to ensure that this communication is fully responsive to the instant office action, and should not be interpreted as an admission that claim 5 is actually or properly rejected.

Claims 5 and 7 have been amended to address the objections thereto, and claim 1 has been amended to clarify its language. In view of at least these amendments and/or the remarks that follow, claims 1-8 (and, therefore, withdrawn claims 9 and 10 as well) are believed to be in condition for allowance.

Applicant notes, for the record, that the amendment to claim 1 is being made solely to expedite allowance of this application. By amending claim 1, Applicant does not acquiesce (a) to its rejection, (b) to the rejection of any or all claims that depend therefrom, or (c) to the reason(s) offered by the Examiner in support of the rejection of claim 1 and/or the claims that depend therefrom. Also, by amending claim 1, Applicant does not dedicate the subject matter of claims 1-10 - as originally filed - to the public. Moreover, Applicant respectfully reserves the right to seek patent protection for a claim that is similar or identical to claim 1 - as originally filed - in a related application.

As noted above, new claims 11-18 are added herein. Claim 11 is similar to claim 1, except that claim 11 recites that the plural ultrasonic units of the ultrasonic cleaning apparatus are arranged in two rows such that at least one end of a certain ultrasonic vibration unit is located toward a substantially center of an ultrasonic vibration unit of the other row. No new matter is added in claim 11, support for which is provided throughout this application (as filed), including, *inter alia*, by reference to FIG. 2, as filed.

New claims 12-18 mirror claims 2-8, as filed, except that claims 15 and 17 reflect the amendments made herein to claims 5 and 7.

New claims 11-18 are believed to fall within Group I, i.e., the Group in which claims 1-8 are classified. Therefore, these claims are suitable for examination in connection with this application, and are believed to be allowable.

**Election/Restrictions**

As discussed above, Applicant affirms its election to pursue claims 1-8 and requests that withdrawn claims 9 and 10 be rejoined to this application upon the allowance of the claim(s) from which they depend.

Also as noted above, newly introduced claims 11-18 are suitable for examination herein because they are believed to fall within Group I (i.e., the Group in which claims 1-8 are classified) as well.

**Claim Objections**

Claims 5 and 7 are objected to pursuant to 37 C.F.R. §1.75(c) as being of improper form for failing to further limit the subject matter of a previous claim.

According to 37 C.F.R. §1.75(c), "one or more claims may be presented in dependent form, referring back to and to further limiting [sic] another claim or claims in the same application." Applicant believes that claims 5 and 7, as filed, complied with the requirements of 37 C.F.R. §1.75(c); however, solely to expedite allowance of this application, Applicant has amended both of these claims.

In view of at least these amendments and/or these remarks, the objections to claims 5 and 7 are either believed to have been overcome or to have been demonstrated to be inappropriate.

**Th Prior Art R j ctions**

Claims 1-4 and 8 are rejected pursuant to 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,890,567 to Caduff ("the Caduff patent"). Also, it appears that the Examiner intended to reject claim 5 pursuant to 35 U.S.C. §102(b) on the basis of the disclosure of the same reference. Claim 6 is rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over the Caduff patent in view of U.S. Patent No. 5,399,017 to Droege ("the Droege patent"), and claim 7 is rejected pursuant to the same statutory provision as being unpatentable over the Caduff patent in view of U.S. Patent No. 4,368,054 to Koretsky et al. ("the Koretsky patent"). Applicant respectfully traverses these rejections, which are believed to be overcome or demonstrated to be inappropriate in view of at least the amendments and/or remarks presented herein.

Amended claim 1 clarifies that plural ultrasonic vibration units are arranged in two rows in a widthwise direction orthogonal to the carrying direction, such that "a substantially center of a certain ultrasonic vibration unit of one row is located toward a space defined between two adjacent ultrasonic vibration units of the other row." Claims 9-10 incorporate the features of claim 1, and, thus, this arrangement as well.

As indicated in the specification, such an arrangement is highly advantageous in that it enables cleaning of one or more materials (e.g., an LCD glass substrate, semiconductor wafer, or the like) with a beneficial combination of efficiency, productivity and thoroughness, wherein the material(s) is/are quickly, yet reliably and evenly cleaned by virtue of this arrangement, which is incorporated into the apparatus of claims 1-8, and the method of claims 9 and 10.

The robotic ship cleaning ultrasonic apparatus disclosed in the Caduff patent does not appear to disclose or suggest the arrangement recited in the ultrasonic cleaning apparatus of claims 1-8 and the sputtering method of claims 9-10. The Examiner asserts that the Caduff patent discloses a plurality of ultrasonic vibrations units, which are depicted in Figures 2-4 of the Caduff patent and described in the accompanying text thereof. The Examiner further asserts that Figure 3 (and its accompanying text) in particular depicts an arrangement of plural ultrasonic vibration units in two rows in a widthwise direction, wherein the vibration unit of one row is located toward a substantially center of two adjacent units of the other row.

Applicant disagrees with the Examiner's interpretation of the Caduff patent, which does not appear to disclose or suggest any noticeable, let alone specific pattern of arrangement of the four ultrasonic transducers (58) depicted in its Figures 3 and 4 thereof. The only potentially discernable arrangement of any equipment that comprises the robotic ship cleaning ultrasonic apparatus of the Caduff patent appears to involve the fluid spray heads (52), and it appears as though the heads are substantially aligned with each other. This is in stark contrast to the staggered configuration of the plural ultrasonic vibration units of claim 1 in which a substantially center of a certain ultrasonic vibration unit of one row is located toward a space defined between two adjacent ultrasonic vibration units of the other row.

Therefore, the highly beneficial arrangement of the plural ultrasonic vibration units of the ultrasonic cleaning apparatus of claim 1 does not appear to be disclosed or suggested by the Caduff patent's ship cleaning ultrasonic apparatus, which does not appear to have *any* specific arrangement, *let alone* the arrangement recited in claim 1.

Similar benefits are enjoyed by the arrangement of the ultrasonic cleaning apparatus of claim 11, and its arrangement is likewise neither disclosed nor suggested by the Caduff patent.

Regarding the Droege patent and the Koretsky patent, assuming - for the sake of argument herein - that either of these references may be properly combined with the Caduff patent, neither the Droege patent nor the Koretsky patent is believed to provide any additional disclosure or suggestion that would support the rejection of either pending claims 1 or new claim 11.

Therefore, claims 1 and 11 are patentable over the cited references, whether such references are considered alone or in proper combination. And in view of the at least the fact that each of claims 2-10 either depends from or incorporates the limitations or incorporates the features of claim 1, and each of new claims 12-18 depends from claim 11, claims 2-10 and claims 12-18 are patentable over these references as well.

In view of at least the amendments and/or remarks set forth above, the objection to claims 5-7 and the rejections of claims 1-8 have been overcome or demonstrated to be inappropriate, and claims 1-8 and 11-18 are believed to be patentable over the cited references. Therefore, reconsideration and allowance of claims 1-8 are respectfully requested, as are consideration and allowance of new claims 11-18, and reinstatement and allowance of claims 9 and 10.

If the undersigned can be of any assistance in advancing the prosecution of this case, the Examiner is invited to contact him through the information given below.

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Respectfully submitted,

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PATENT TRADEMARK OFFICE

Version of amendments with markings to indicate amended subject matter

Any additions to the amended subject matter are underlined, and any deletions are contained within brackets.

In the Claims

Please amend claims 1, 5 and 7 of the application as follows:

1. (Amended) An ultrasonic cleaning apparatus in which ultrasonic vibration is applied to at least part of cleaning solution, and, by a piece-by-piece method, a material to be cleaned is cleaned with the cleaning solution while being carried in a predetermined direction, the ultrasonic cleaning apparatus comprising:

a plurality of ultrasonic vibration units each having a nozzle elongated in one direction, for spraying cleaning solution from the nozzle to the material to be cleaned, the cleaning solution being applied with ultrasonic vibration by a vibration plate to which a vibrator is fixed so as to pair up therewith,

wherein the plural ultrasonic vibration units are arranged in two rows in a widthwise direction orthogonal to the carrying direction, and also so arranged that a substantially center of a certain ultrasonic vibration unit of one row is located toward a [substantially center of] space defined between two adjacent ultrasonic vibration units of the other row.



5. (Amended) The ultrasonic cleaning apparatus of claim 4,  
wherein the internal pressure of the enclosed space portion of the casing is  
higher than the pressure of the cleaning solution which is supplied to the nozzle and  
is ejected therefrom.

7. (Amended) The ultrasonic cleaning apparatus of claim [1] 2,  
wherein the [ultrasonic vibration in use has a frequency] high frequency power  
supplied to the vibrator is within a range of 400 kHz to 2MHz.